

CLAIMS

What is claimed is:

1. An electric motor vehicle comprising:
a wheel containing a motor stator and a motor rotor;
an integrated structure fabricated from a unitary non-ferromagnetic substance, said structure having a wheel axle portion and a motor stator mounting element portion, the stator mounting element portion having a cylindrical configuration with its axis collinear with the axis of the axle, the integrated structure comprising a central passage that extends along the axis of the axle portion and the stator mounting element portion; and
wherein at least one ferromagnetic segment of the motor stator is joined directly to the stator mounting element.
2. An electric motor vehicle as recited in claim 1, wherein the diameter of the cylindrical stator mounting element portion is greater than its length in the direction of the axis and the axle portion comprises a section formed at each axial side of the stator mounting element portion.
3. An electric motor vehicle as recited in claim 1, wherein the rotor comprises an annular ring configuration radially surrounding the stator and separated therefrom by a radial air gap, and a rotor housing; and
the rotor housing is journaled to the axle portion via bearings.

4. An electric motor vehicle as recited in claim 3, wherein the wheel axle portion extends on each axial side of the motor stator mounting element and bearings circumscribe the axle portion on both sides of the motor stator mounting element.

5. An electric motor vehicle as recited in claim 3, wherein a wheel assembly is mounted on the rotor housing.

6. An electric motor vehicle as recited in claim 1, wherein the motor stator mounting element portion comprises cooling means in communication with said central passage for cooling the stator.

7. An electric motor vehicle as recited in claim 6, wherein said cooling means comprises:

a plurality of cavities, each cavity formed along an arc at a fixed radial distance from the axis and extending in a direction parallel to the axis from a

5 first end to a second end; and

heat exchanger surfaces provided in the cavities.

8. An electric motor vehicle as recited in claim 7, wherein said central passage is hollow and contains a barrier to prevent flow of air directly along the entire passage, the barrier located in the central passage at a position

intermediate the locations along the axis of the first and second ends of the
5 cavities; and

said cooling means further comprises a channel at each end of each
cavity extending in the radial direction from the respective cavity to an
opening in the central passage;

whereby incoming air from one end of the central passage is directed
10 through inlet channels to the first ends of the cavities, through the cavities and
heat exchanger surfaces to the second ends of the cavities, through the outlet
channels at the second ends and into the central passage.

9. An electric motor vehicle as recited in claim 1, further comprising
at least one channel in a first of the wheel axle portion sections for providing
wire access to the motor stator.

10. An electric motor vehicle as recited in claim 9, wherein the
diameter of the first wheel axle portion section is greater than the diameter of
the other wheel axle portion section.

11. An electric motor vehicle as recited in claim 1, wherein the motor
stator comprises a plurality of ferromagnetic core segments ferromagnetically
isolated from each other.